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Research Article

Incidence of chronic kidney disease stages 3-5 among medical admissions in Ain Shams university hospitals

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Abstract

Background: Chronic kidney disease (CKD) at any level is associated with poor outcomes which are impacted by modifiable risk factors that present long time before initiation of dialysis as (anemia, hypertension, dyslipidemia).**Objectives:** To highlight the importance of data registry application in CKD patients in Egypt to emphasize the medical and economic burden faced annually. **Patients and Methods:** This study was an observational prospective cohort study that performed on 448 newly diagnosed CKD patients (205 males [45.8%])and (243females[54.2%]) all with (Stages 3-5) in Emergency Room **of** Ain Shams University Hospitals, Cairo, Egypt. They were monitored over 6 months from November 2009 to April 2010. All underwent (CBC, kidney function tests[serum BUN, creatinine], urine analysis, creatinine clearance, pelviabdominal ultrasound, collagen markers).**Results**: CKD stage 3(8.3%),stage 4(29.9%) and stage5(61.8%)being the commonest. Regarding etiology; (21.9%) were diabetic and hypertensive, (21%)hypertensive ,(13.8%)unknown etiology,(10%)diabetic,(10%)chronic pyelonephritis, (6.9%)obstructive uropathy, (4.5%) chronic glomerulonephritis, (4%)SLE, (2%)Adult Polycystic Kidney Disease(APKD), (1.6%)reflux nephropathy, cardiorenal syndrome and chronic interstitial nephritis(1.3%)each,(1.1%)analgesic abuse and finally amyloidosis (0.4%) patients. With the commonest cause of CKD being diabetes and hypertension coexisting together. **Conclusion:** CKD is very common worldwide and often asymptomatic, therefore patients with risk factors as diabetes and hypertension must be screened and followed up regularly for appropriate management before developing end stage renal disease.

Keywords: chronic kidney disease, hypertension, diabetes, chronic glomerulonephritis.

Introduction

Kidney disease is characteristically asymptomatic and is often not diagnosed until relatively advanced. Evidence is accumulating that chronic kidney disease (CKD) at any level is associated with poor outcomes which are impacted by modifiable risk factors that present long term before initiation of dialysis as (anemia, hypertension, dyslipidemia, nutritional status, abnormalities of calcium and phosphorus metabolism)(1). KDOQI recommends evaluation of a patient for kidney disease only when GFR is 60ml/min/1.73m2 in the presence of a risk factor (2).Chronic glomerulonephritis and interstitial nephritis are currently the principal causes of chronic kidney disease in developing countries, reflecting the high prevalence of bacterial, viral, and parasitic infections as tuberculosis which ranks high in India and the Arabian Gulf, whereas streptococcal infections of the throat and skin remain major causes of glomerulonephritis in Africa. Viral infections are responsible for the high incidence of glomerulonephritis in some regions — for example, hepatitis B virus in South Africa, hepatitis C virus in Egypt, and the human immunodeficiency virus in sub-Saharan Africa. Several parasitic infections cause ESRD through ureteric obstruction (e.g., schistosomiasis, in most of Africa), interstitial nephritis (e.g., kala-azar [visceral leishmaniasis]) in many African and Asian countries, glomerulonephritis (e.g., malaria and filariasis,) in West Africa; and schistosomiasis, in Africa and Latin America. Diabetes causes (9.1% to 29.9%) of the cases of ESRD in various developing countries, and hypertension leads to (13% to 21%) of the cases. Other important causes include urolithiasis with subsequent obstruction and

infection, long-term drug abuse, and possibly environmental pollution as occupational exposure to lead, cadmium, and mercury(3).The attention being paid globally to CKD is attributable to: rapid increase in its prevalence, the enormous cost of treatment, data suggesting that overt disease is the tip of the iceberg of a covert disease, an appreciation of its major role of increasing the risk of cardiovascular disease and the discovery of effective measures to prevent its progression(4).

Patients and methods

This study was an observational prospective cohort study that was performed on 448 newly diagnosed CKD patients (205 males [45.8%]) and(243 females [54.2%]) all with (Stages 3-5) out of 13551 which is the total number of admissions in Emergency Room **of** Ain Shams University Hospital, Cairo, Egypt. The a mean age of patients was 55.787 years ± 2.151 years. These patients were monitored over a period of 6 months starting from the first of November 2009 to the thirtieth of April 2010.

All patients were subjected to:

1-Thourough history taking and detailed clinical examination.
2) Routine laboratory investigations as:

- ➢ Serum creatinine, blood urea nitrogen.
- ➢ Urine analysis including (urinary albumin, urinary RBCs, urinary WBCs)
- ➢ Estimated (GFR) glomerular filtration rate using (MDRD) Modification of Diet in Renal Disease equation and Cockroft Gault equation.
- ➢ Staging of CKD was done using MDRD equation.
- ➢ Pelviabdominal Ultrasound.
- ➢ Collagen markers and renal biopsy were done when needed.

Statistical methodology

Analysis of data was done by using SPSS (statistical program for social science version 12) using **Chi-square test** and **t-test.**

Results

Table (1): Number and the percentage of CKD patients monthly for 6 months.

Months(2009/2010)	No of CKD patients	%
NOVEMBER	53	11.83
DECEMBER	53	11.83
JANUARY	47	10.49
FEBRUARY	91	20.31
MARCH	112	25.00
APRIL	92	20.54
Total	448	100.00
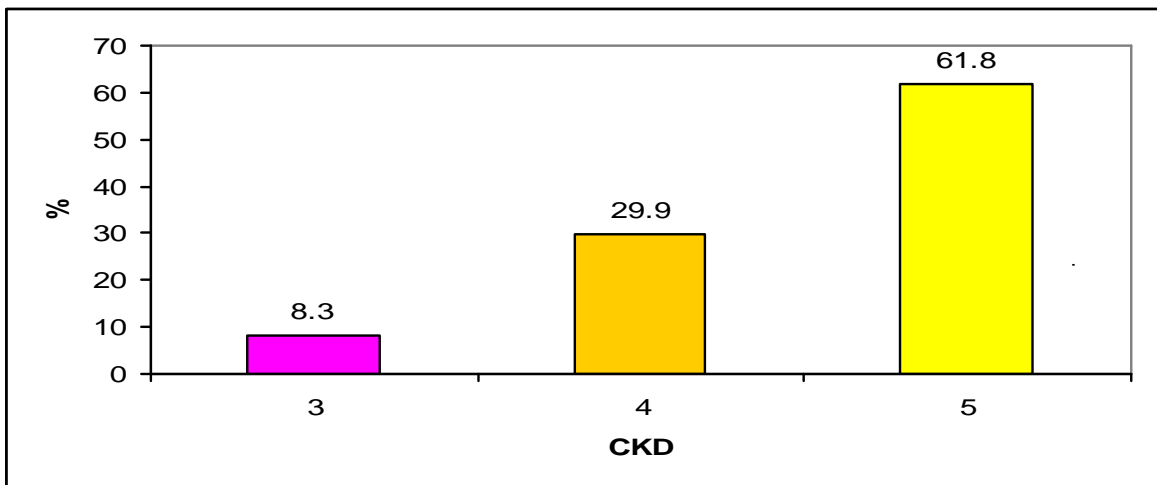
Figure (1): Patients with Chronic kidney disease Stages 3-5 among over 6 months.
With CKD stage 5 being the commonest among patients pointing to late referral to seek medical advice.

Table (2): Demographic data of patients over 6 months

Months	AGE				
	Range		Mean	±	SD of Mean
NOVEMBER	17.0 -	90.0	54.075	±	2.16212
DECEMBER	23.0 -	85.0	53.943	±	1.94769
JANUARY	21.0 -	84.0	55.787	±	2.15108
FEBRUARY	16.0 -	84.0	55.462	±	1.56599
MARCH	20.0 -	82.0	55.000	±	1.44532
APRIL	20.0 -	80.0	54.967	±	1.49649

Months	Sex					
	Female		Male		Total	
	N	%	N	%	N	%
NOVEMBER	30	56.60	23	43.40	53	100.00
DECEMBER	35	66.04	18	33.96	53	100.00
JANUARY	24	51.06	23	48.94	47	100.00
FEBRUARY	52	57.14	39	42.86	91	100.00
MARCH	52	46.43	60	53.57	112	100.00
APRIL	50	54.35	42	45.65	92	100.00
Total	243	54.24	205	45.76	448	100.00
Chi-square X^2	6.345					
P-value	0.274					

Table (3): Etiology of CKD stages 3-5 among patients over 6 months

Etiology	Frequency	Percent %
DM	45	10.0
HTN	94	21.0
DM & HTN	**98**	**21.9**
Obstructive Uropathy	31	6.9
Chronic GN	20	4.5
Chronic pyelonephritis	45	10.0
Chronic Interstitial Nephritis	6	1.3
ADPKD(adult polycystic kidney disease)	9	2.0
Reflux	7	1.6
SLE	18	4.0
Amyloidosis	2	0.4
Analgesic Abuse	5	1.1
Cardiorenal $	6	1.3
Unknown	62	13.8
Total	448	100.0

Table (4): Etiology of CKD stages 3-5 among patients within the age range of 16-36 years.

Etiology	AGE (16-36)	Percent %
DM	4	6
HTN	6	9
DM & HTN	3	5
Obst. Uropathy	2	3
Chronic GN	4	6
Chronic pyelonephritis	11	17
Chronic Interstitial Nephritis	1	2
ADPKD	2	3
Reflux	5	8
SLE	**15**	**23**
Amyloidosis	0	0
Analgesic Abuse	0	0
Cardiorenal $	0	0
Unknown	11	18

Table (5): Etiology of CKD stages 3-5 among patients within the age range of 37-56 years.

Etiology	AGE (37-56)	Percent %
DM	18	11
HTN	29	18
DM & HTN	**31**	**19**
Obst. Uropathy	9	6
Chronic GN	9	6
Chronic pyelonephritis	18	11
Chronic Interstitial Nephritis	4	3
ADPKD	3	2
Reflux	2	1
SLE	2	1
Amyloidosis	1	1
Analgesic Abuse	4	3
Cardiorenal $	3	2
Unknown	23	16

Table (6): Etiology of CKD stages 3-5 among patients within the age range of 57-76 years.

Etiology	AGE (57-76)	Percent %
DM	26	12
HTN	53	25
DM & HTN	**56**	**26**
Obst. Uropathy	18	9
Chronic GN	5	2
Chronic pyelonephritis	14	7
Chronic Interstitial Nephritis	1	0.5
ADPKD	3	1.5
Reflux	0	0
SLE	0	0
Amyloidosis	2	1
Analgesic Abuse	1	0.5
Cardiorenal $	3	1.5
Unknown	**27**	**14**

Table (7): Etiology of CKD stages 3-5 among patients within the age range of 77-96 years.

Etiology	AGE (77-96)	Percent %
DM	0	0
HTN	5	26
DM & HTN	**6**	**32**
Obst. Uropathy	2	11
Chronic GN	0	0
Chronic pyelonephritis	2	11
Chronic Interstitial Nephritis	0	0
ADPKD	1	5
Reflux	0	0
SLE	0	0
Amyloidosis	0	0
Analgesic Abuse	0	0
Cardiorenal $	0	0
Unknown	3	15

Regarding the commonest causes of CKD stages 3-5 among patients, Systemic lupus erythematosus prevailed within the age range of (16y-36y), where as in all other age ranges (37-56y),(57-76y),(77-96y) co – affection with both DM and HTN was the most prevailing cause of CKD stages 3-5 throughout the 6 month duration of this study.

Within all the age ranges in this study, Stage 5 CKD was the commonest stage of presentation. At the age(16-36y),forty (40) patients with stage 5 CKD(63%), at the age range of (37-56y) there were one hundred and one(101) patients with stage 5 CKD(67%),at the age range of (57-76y) there were one hundred and nineteen(119) patients with stage 5 CKD(57%) and finally at the age range of (77-96y) there were eleven (11) patients with stage 5 CKD(58%).

Discussion

Chronic kidney disease is a major global public health problem(5).The incidence of CKD in the adult population worldwide was estimated at 0.9% per year and its increase has largely been driven by population aging and the epidemics of diabetes, vascular disease and obesity(6).Individuals with CKD are often asymptomatic until advanced stages, making detection and identification difficult as data from various outpatient settings have demonstrated that the majority of CKD cases may be unrecognized(7).However, in developing countries there is paucity of data and lack of registration of CKD patients in primary, secondary and tertiary care hospitals, although their early detection and management may improve the outcome medically and financially, hence this study was done.

In this study CKD stage 3 represented (8.3%) of the patient population, stage 4 represented (29.9%) and stage 5 represented (61.8%) representing the majority of patients, while in the study by Sh U-Hong Bi et al.(8)done mostly on outpatients(57.65%) and ER patients(14.5%), CKD stage 3 represented (50.5%),stage 4 represented (19.9%) and stage 5 represented (30%).

The commonest cause of CKD in this study was diabetes and hypertension co- existing together, while in the study of Khakurel et al. (9), chronic glomerulonephritis was the leading cause followed by diabetes and finally hypertension. Results of the Khakurel et al. (9) study were also similar to those of Aggarwal et al.(10) in the causes of CKD with chronic glomerulonephritis being the commonest (39.32%) followed by diabetes(19.16%) then interstitial nephritis(16.6%), where as in this study, interstitial nephritis represented only (1.3%) and amyloidosis only (0.4%) of the causes of CKD both causes are probably underestimated to the unavailability of renal biopsy for all patients.

As regards the incidence of ESRD in Egypt according to the Egyptian society of nephrology, hypertension (36.6%) is the commonest cause followed by (15.2%) unknown etiology, diabetic nephropathy (13.5%), chronic glomerulonephritis(7.8%), reflux nephropathy

and chronic pyelonephritis(6.5%), obstructive uropathy(5.6%), adult polycystic kidney disease(3.2%), analgesic nephropathy(2.8%), pregnancy related complications (1.6%), urinary shistosomiasis(1.5%), SLE and gout each one (0.9%), amyloidosis (0.7%)(11).

Regarding the relation between the patient's sex and etiology in this study, hypertension was the commonest cause in males, while both diabetes and hypertension when co existed together were the commonest causes in the females, besides the fact that chronic pyelonephritis and interstitial nephritis were more common among male patients in our study which was contrary to that found by Drey et al.(12) as his study revealed that men presented mostly with glomerular and vascular disease as well as urinary obstruction, where as the females mostly presented with chronic pyelonephritis and tubulointerstitial disease.

One of the principle findings of this study is that a good follow-up system is urgently needed. Most studies in this issue similarly highlighted the importance of careful follow-up to optimize therapy, detect exacerbations early and improve adherence to treatment guidelines (13).

Conclusion

We can conclude from this study that chronic kidney disease is very common worldwide and often asymptomatic, therefore patients with risk factors as diabetes and hypertension must be screened and followed up regularly for appropriate management before developing end stage renal disease.

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